

Mexican Spotted Owl Habitat **Environmental Analysis** Project Checklist

June 7, 2021

The purpose of this document is to assist and guide Interdisciplinary Teams (IDT) on how to conduct environmental analysis for vegetation management projects that would implement mechanical and prescribed fire treatments within Mexican spotted owl habitat.

All vegetation management project documentation/analysis **are required to** address the following list of items to assure consistency with forest plans and the Recovery Plan (RP) for the Mexican spotted owl (MSO), First Revision (USFWS 2012).

*As the IDT conducts the analysis it should consider the caution on pages 74-75 in the 2012 Recovery Plan that much of the work needed to reduce the fire risk to Mexican spotted owl habitat can be achieved by treating areas outside of PACs and Recovery nest/roost habitat to develop forest structure and density conditions that facilitate low severity surface fires in the surrounding project landscape. Often, these forest restoration treatments outside the PACs can be combined with minimal treatments inside the PACs such as low thinning, selection cutting, and prescribed burning to also facilitate lower severity fire behavior potential within the PACs. Management approaches to protecting and enhancing PAC habitats should be based on local existing and projected vegetation conditions, and management alternatives focused on the minimal treatments necessary to protect or enhance PAC habitats.

Project: Rock Creek TS

District, Forest: Cuba RD, Santa Fe NF

Date: 07/15/2021 (Prepared by Ramon Borrego. Reviewed and approved by Andre M. Silva on 08132021)

Task	✓ = done	Comments
Project and Analysis Area:		
1. Clearly delineate and display the project area .	✓	Project boundary/area, action area described in proposed action as well as Biological Assessment
2. Clearly delineate and display or describe the analysis (action) area	✓	
3. Identify Forest Cover Type (e.g., mixed conifer, pine-oak, other forest and woodland; see Appendix C, pp. 250-256, of the MSO Recovery Plan, First Revision; USFWS 2012)		
Mexican spotted owl habitat delineated in the project area (locations mapped, and total acres displayed):		
1. Protected Activity Centers identified in the project/action area. These are mapped and total acres are displayed	✓	No PAC identified on project/action area
2. Recovery Habitat includes all mixed conifer, riparian forests, and pine-oak for some Ecological Management Units (EMUs). Refer to the MSO Recovery Plan, First Revision; USFWS 2012 for locations of EMUs, on Figure II.1 on pg. 9, for EMU descriptions see pp. 10-14 and for Forest types for Recovery habitat associated with each EMU see Table C.3.	✓	
3. Recovery Nest/Roost Habitat identified and delineated in the project/action area.	✓	
a. Recovery Nest/Roost Habitat are mapped, and the minimum percentages are delineated for the project area and/or the unit (District or Forest). The following data sources could be used identify and map these areas: <ul style="list-style-type: none"> Contemporary stand exam data should be used where available. Absent stand exam data, other sources of information may be used: 		Modeled layers identified 138 acres of R N/R habitat (field verified, Map #3 in BA) within timber treatments . Ecological Recovery Unit (ERU) layer shows 1,596 acres of mixed conifer-frequent fire

<ul style="list-style-type: none"> ○ imputed nearest neighbor, ○ LiDAR, ○ Landsat remote sensing, ○ geophysical modeling, ○ slope, ○ aspect, ○ field examination by a certified Silviculturists and a qualified biologist ○ Regional Recovery Habitat map ○ Habitat Trend Modeling information (Gavin Jones et al.) that will be useful in identifying recovery nest/roost habitat. <p>This should be accomplished with coordination with the U.S. Fish and Wildlife Service (FWS), a certified Silviculturist and a qualified biologist.</p>		(31.4%) vegetation type. MSO recovery habitat field evaluations were conducted on 09/03/2020 and 10/08/2020. These evaluations sought to determine if forest stands meet criteria for recovery nest/roost (target/threshold) habitat as defined within the recovery plan for the Mexican Spotted Owl. Criteria are based on the "mixed-conifer" definition and stand metrics on table III.B.1. (pg. 92) of the plan. Field evaluations determined 1,177 acres met criteria for recovery nest/roost (target/threshold).
i. Describe the methodology used to identify and delineate recovery nest\roost habitat for project/unit.		See above.
b. Identify the areas that currently meet or are above the minimum desired conditions listed in Table C.3 of the Recovery Plan (p. 278), or areas that have the greatest potential to attain these conditions in the appropriate locations on the landscape (e.g., cooler, north/northeast-facing aspects).		
4. Recovery Dispersal/Forage Habitat identified and delineated in the project/action area.	✓	MSO Recovery habitat evaluations (stand exams) were conducted in areas which appeared to be mixed conifer according to the ERU. Only one out of twelve plots had a minimum basal area (BA) of 120 BA. Four plots (7, 10, 11 and 12) were lacking mixed conifer habitat associated with MSO recovery habitat. These stands are open, even-aged "pure ponderosa pine" stands as defined within the recovery plans and are not considered recovery habitat in either recovery plan.
5. Critical Habitat Unit(s) identified and delineated in the project/action area.	✓	176 acres identified in project boundary(Map 5 – BA) . See biological assessment for CH determination and PCEs)
a. Quantify area of critical habitat in the critical habitat unit and within the project area.		
b. List all primary constituent elements (PCEs) of the physical and biological features in the Biological Assessment.		
Pre-project surveys within the project area as well as ½ mile beyond in MSO habitat.		See field verification comments above.
I.A.1 Description of existing, pre-treatment conditions in PACs:		
1. Describe conditions INSIDE OF NEST/ROOST CORE AREA.	✓	No PAC identified, no core area impacted
a. Core areas will be deferred from mechanical treatment. (Appendix D of the Recovery Plan p. 316)		
b. Provide information regarding broadcast burning outside of the breeding season or during if non-breeding is inferred or confirmed for that year. Provide information that describes the plan and conditions that help to ensure the burn can be conducted at a low intensity with low severity effects.		
c. Provide existing condition information as related to Table C.3		
I.B.2 Description of post-treatment conditions in PACs immediately following prescribed burning:		
1. Describe conditions INSIDE OF NEST/ROOST CORE AREA.		
I.A.2 Description of existing, pre-treatment conditions in PACs:	NA	
1. PAC OUTSIDE OF NEST/ROOST CORE AREA.	NA	
• Fire risk assessment within the project area and in the planning area.		
• Provide information regarding how the proposed treatments in the PAC, outside nest/roost core, may reduce fire hazard while striving to maintain or improve habitat conditions for the owl and its prey.		

<ul style="list-style-type: none"> Assess the percentage of proposed mechanical treatments in non-core PAC area for the EMU. Should not exceed 20 %. However, treatments can exceed 20 % of the non-core area within a single PAC if justified to affect fire behavior to reduce the risk to nest/roost cores. 		
<ul style="list-style-type: none"> No prescribed fire or mechanical treatments should occur within PACs during the breeding season unless non-breeding is inferred or confirmed the year of treatment per the accepted protocol (Appendix D, Recovery Plan). 		
<ul style="list-style-type: none"> Removal of hardwoods, downed woody debris, snags, and other key habitat variables should occur only when compatible with owl habitat management objectives as documented through reasoned analysis. 		
<ul style="list-style-type: none"> All treatments in PACs should be coordinated with the appropriate FWS Office. 		
2. Description may include the following conditions:		
a. Diversity of patch size outside nest/roost core		
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		
d. Diverse composition of vigorous native herbaceous and shrub species.		
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).		
g. Structural diversity of trees		
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		
I.B. Description of post-treatment conditions in PACs immediately following thinning and/or prescribed burning:		
1. PAC OUTSIDE OF NEST/ROOST CORE. May include information regarding the following:	NA	
a. Diversity of patch size outside nest/roost core		
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		
d. Diverse composition of vigorous native herbaceous and shrub species.		
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).		
g. Structural diversity of trees.		
h. Diversity of tree sizes with goal of having trees ≥16" DBH contributing ≥50% of the stand basal area.		
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		
II.A Description of existing, pre-treatment conditions in <i>RECOVERY nest/roost habitat</i> ⁎:		

1. Describe conditions <i>inside of recovery nest/roost habitat</i> .	✓	<p>Timber portion of Project did not meet Recovery nest /roost habitat conditions as identified in Table C.3 Of the 138-ac identified by modeled layers, none meets the basal area requirement.</p> <p>In other sections of the project area, the proposed treatment is “thin from below” and/or “low-intensity prescribed fire”. In these areas proposed treatments would enhance stand structure through time and move current conditions closer towards recovery nest roost habitat. This would occur by increasing the proportion of basal area represented by large trees, and by releasing the residual stand structure to hasten development of large diameter trees.</p>
a. Mechanical treatments are not recommended in recovery nest/roost habitat and should be deferred. Though avoidance should be the first choice, there may be very limited circumstances, if warranted for the benefit of the owl, when minimal mechanical treatment may be needed as described in the MSO Recovery Plan.		
b. Provide Justification for any mechanical treatment or thinning		
c. Provide information regarding broadcast burning		
d. Provide existing condition information as related to Table C.3		
<i>* if stand exam data exists for delineated nest/roost recovery habitat at the time of the analysis, then follow Regional MSO Habitat Treatment Implementation Guidance to conduct the analysis and develop the proposed action.</i>		
II.B. Description of post-treatment conditions in <i>recovery nest/roost habitat</i>*		
1. If treatments are proposed in recovery nest/roost habitat , provide justification with specific information for why treatments are necessary and why deferment isn't an option or if conditions are not suitable as recovery habitat and how the treatment will directly improve owl habitat., Provide post-treatment condition information as related to Table C.3 in the Recovery Plan, First Revision (USFWS 2012), or Table III.B.1 in the original MSO Recovery Plan (USFWS 1995) if working under the 1996 amendment to your forest plan. Describe how it meets Forest Plan requirements. <i>Do not treat the minimums in Table C.3 as targets rather treat only what is minimally needed.</i>	✓	<p>As stated above, there is a need to move the current condition of mixed conifer forests within the project area closer to the desired conditions of Table C.3. In general, Recovery Nest Roost habitat is lacking within the project area (i.e., large tree component in mixed conifer stands). Treatments within mixed conifer will facilitate moving stand trajectories closer to recovery nest roost by thinning small diameter trees. However, it is unlikely that any of the stands within the project area would meet Table C.3 within the ‘reasonably foreseeable future’ (20-30yr) timeframe described by the 2012 Recovery Plan. This is because of the close proximity of the stands to high use recreation areas, the stands being interspersed with pure ponderosa pine stands and – the topographic positioning of the stands does not lend its self to development of nest roost habitat. They do not have high topographic relief, are drier sites and would not make suitable nesting areas in the near future.</p>
2. Replacement nest/roost habitat post-treatment variables:		
a. % of recovery habitat in the project area/planning area		
b. Canopy cover		

c. Basal area		
d. % Basal Area 30-46 cm (12-18 in) diameter at breast height (dbh)		
e. % Basal Area >46 cm (>18 in) dbh		
f. Large trees >46 cm (>18 in) dbh per acre		
<i>* if stand exam data exists for delineated nest/roost recovery habitat at the time of the analysis, then follow Regional MSO Habitat Treatment Implementation Guidance to conduct the analysis and develop the proposed action.</i>		
III.A. Description of pre-treatment conditions in recovery habitat:		
1. <u>Recovery dispersal/foraging habitat</u> , that is, recovery habitat outside of recovery nest/roost habitat. May include the following information:	✓	1177 acres of recovery dispersal/foraging habitat (target/threshold). The project area contains coniferous forest and woodlands occasionally interspersed with small, enclosed meadows dominated by grasses and shrubs. The ecological unit habitat type is ponderosa/dry mixed conifer forest. Aspen clumps are scattered throughout the project area in higher elevations. Riparian habitat is limited with two well established streams Clear Creek and Rio de La Vacas.
a. Diversity of patch size outside nest/roost core		
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		
d. Diverse composition of vigorous native herbaceous and shrub species.		
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).		
g. Structural diversity of trees		
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		
III.B. Description of post-treatment conditions in <u>recovery dispersal/foraging habitat</u> outside of recovery nest/roost habitat:		
2. Recovery habitat dispersal/foraging habitat, that is, recovery habitat outside of recovery nest/roost habitat. May include the following information:	✓	Timber and fuels treatments will maintain or increase foraging/ dispersal habitat. Most of the larger diameter trees and logs would not be consumed in the proposed low to moderate intensity burn, which would primarily kill small trees less than 10" in diameter along with smaller diameter dead and down fuels. Over most of the area, the overstory forest canopy would be retained with minimal modifications (created openings), even though individual trees and small patches may be burned. Thus, the amount of MSO recovery habitat would not be reduced.
h. Diversity of patch size outside nest/roost core		
i. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		
j. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		
k. Diverse composition of vigorous native herbaceous and shrub species.		
l. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		
m. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).		
n. Structural diversity of trees		

Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		
IV. Description of pre and post treatment conditions in Critical Habitat – Critical habitat is specific geographic areas that are essential for the conservation of a threatened or endangered species and that may require special management considerations. Primary constituent elements (PCE's) are found within these specific geographic areas. PCE's are essential to the conservation of the owl and include those physical and biological features that support nesting, roosting, and foraging. Designated critical habitat only exists in areas defined as MSO habitat in the 1995 Recovery plan and its 2012 revision see https://ecos.fws.gov/ecp/report/criticalHabitat .		
A. Primary constituent elements related to forest structure:	✓	Of the 176 acres of critical habitat, 20 acres meet forest structure (A) and high volumes of fallen trees and other woody debris (B1).
1. a range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches (0.3 meters) or more when measured at 4.5 feet (1.4 meters) from the ground;		
2. a shade canopy created by the tree branches covering 40 percent or more of the ground; and		
3. large dead trees (snags) with a trunk diameter of at least 12 inches (0.3 meters) when measured at 4.5 feet (1.4 meters) from the ground.		
B. Primary constituent elements related to maintenance of adequate prey:	✓	Of the 176 acres of critical habitat, 20 acres meet forest structure (A) and high volumes of fallen trees and other woody debris (B1).
1. High volumes of fallen trees and other woody debris;		
2. A wide range of tree and plant species, including hardwoods; and		
3. Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.		
C. Primary constituent elements related to canyon habitat include one or more of the following:	✓	Although Canyon Habitat does not occur within the project area, it may be present within the action area and the larger landscape of the Jemez Mountains on the Santa Fe National Forest.
1. presence of water (often providing cooler and often higher humidity than the surrounding areas);		
2. clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation.		
3. canyon wall containing crevices, ledges, or caves; and		
4. high percent of ground litter and woody debris.		
Develop monitoring plan with the FWS, may include one or both of the following:		No PACs present. No additional MSO monitoring required. Additional timber and fuels data collection will occur. No post treatment MSO monitoring required. Post treatment common stand exam and fuels treatment monitoring will occur to verify treatments.
1. Monitor occupancy and reproduction in treated Mexican spotted owl PACs		
2. Management Experiments for treatments in PACs (Box C.5, pp. 281-283, 2012 MSO RP)		
3. Monitor pre- and post-treatment		
Report implementation of the action and compliance with the terms and conditions as required by the reasonable and prudent measures in the incidental take statement of the biological opinion, or other consultation document (e.g., measures included in concurrence letter for NLAA determinations), and associated NEPA documentation and analysis and make		

*if stand exam data exists for delineated nest/roost recovery habitat at the time of the analysis, then follow MSO habitat treatment implementation guidance to conduct the analysis and develop the proposed action.

¹ % of area pertains to the percent of the planning area, subregion, and/or region in the specified forest type that should be managed for threshold conditions.

²BAs in m²/ha (ft²/acre) and include all trees >1inch dbh (i.e., any species). We emphasize that values shown are **minimums**, not targets.

³Trees > 46 cm (18 inches) dbh. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets. We encourage retention of large trees.

⁴Pine-oak forest type: $\geq 10\%$ of the stand BA or 4.6 m²/ha (20 ft²/ac) of BA consist of Gambel oak ≥ 13 cm (5 in) diameter a root collar.

⁵Pine-oak recommendations apply only to the Mount Taylor and/or Zuni Mountains regions within the CP EMU.

Please also refer to Appendix C in the 2012 Mexican Spotted Owl Recovery Plan, First Revision, for recommended management actions, monitoring treatment effects, and information on desired conditions for nest/roost core areas, PACs, and recovery habitat.

Table C.2 and C.3 in Appendix C of the Mexican Spotted Owl Recovery Plan, First Revision (USFWS 2012) referenced above in the checklist.

Table C.2. (Below) Generalized description of key habitat variables comprising Desired Conditions in forest, riparian, canyon, and woodland cover types typically used by Mexican spotted owls for nesting and roosting. **Desired conditions should guide management within PACs and recovery nest/roost habitats.** The ecological relevance of each desired condition to this owl subspecies and examples of variables that may be useful to quantify desired conditions are also shown. Where possible numbers are derived from past research, where information was unavailable, we used the collective best professional knowledge of the Recovery Team.

276 Desired Condition	Relevance to Owl	Potential Variables (Examples)
Strive for a diversity of patch sizes with minimum contiguous patch size of 1 ha (2.5 ac) with larger patches near activity center; mix of sizes towards periphery (Peery et al 1999; Grubb et al 1997; May and Gutiérrez 2002). Forest type may dictate patch size (i.e., mixed conifer forests have larger and fewer patches than pine-oak forest). Strive for between patch heterogeneity.	Nest/roost habitat patches are the most limiting habitat for the owl. Patches should enhance spatial heterogeneity, provide nest/roost options, provide varied microclimates (thermoregulation) options, and create edges for prey species (e.g., <i>Neotoma</i>).	Size, cumulative acreage, density of patches, % of landscape, amount of edge habitat, average patch canopy cover, average age of dominant overstory component of patch. Frequency distribution of patches by size class, total edge, core to edge distance, fractal index of patch (area to edge ratios).
Horizontal and vertical habitat heterogeneity within patches, including tree species composition.* Patches are contiguous and consist of trees of all sizes, unevenly spaced, with interlocking crowns and high canopy cover (Ganey et al. 2003).*	Provides roosting options, thermal and hiding cover for the owl, and habitat for a variety of prey species.	Patch size and configuration (shape), juxtaposition (topology of patches), interspersation, edge length; canopy cover by height strata; number of vegetation strata present (herbaceous, shrub, sapling, pole, mature trees); uneven tree spacing.
Tree species diversity, especially with a mixture of hardwoods and shade-tolerant species (Willey 1998).* For example, Gambel oak provides important habitat for woodrats and brush mice (Block et al. 2005, Ward 2001)	Provides habitat and food sources for a diversity of prey, roosting options, and perches and hiding cover for young owls during early flight development. Large tree-form Gambel oaks are an important nesting substrate for owls (Ganey et al 1992; SWCA 1992; May and Gutiérrez 2002). Diversity increases probability of some tree species setting seed in a given year. Owls use hardwoods (e.g., big-toothed maple, western hop hornbeam and chinkapin oak) for roosting (Mullet and Ward 2010)	Species occurrence (presence), diversity indices (including richness and equitability), BA by species, density/species.
Diverse composition of vigorous native herbaceous and shrub species (Ward 2001).*	Provides sustainable habitat for a variety of prey; fine fuels to carry surface fire.	Cover/plant group; plant height; vertical density profile; diversity measure (e.g., richness and equitability); vertical distribution; maximum height.
Opening sizes between 0.04 - 1 ha (0.1 - 2.5 ac).* Openings within a forest are different than natural meadows. Small canopy gaps within forested patches provide for prey habitat diversity. Openings should be small in nest/roost patches, may be larger in rest of PAC.	Openings provide habitat for a variety of prey and can slow or reduce fire severity by breaking the continuity of dense tree canopies and ladder fuels.	Frequency distribution of openings by size class, % of landscape in openings. Grass and herbaceous cover in openings (Daubenmire plots for coverage percent).
Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer (Ganey et al. 2003).* Measure canopy cover within stands.	Provides thermal environment needed for nesting/roosting and prey habitat.	Canopy cover line or point intercept method).

*Rocky Canyon Recovery Habitat: results from habitat studies suggest these desired conditions are important in canyon environments where forest, woodland, and riparian habitats are present (e.g., Zion National Park).

Table C.3. Minimum desired conditions for mixed-conifer and pine-oak forest areas managed for Recovery nesting/roosting habitat. Forest types are defined in Appendix C, above. Parameter values are based on averages among plots sampled within forest stands. Numbers of stands included in analysis: 74 for Basin and Range-East (BRE), 27 for mixed-conifer forest in other EMUs, and 47 for pine-oak forest.

EMU(s) Forest Type	% of Area ¹	% BA by size class		Minimum tree BA ²	Minimum density of large trees ³
		30-46 cm dbh (12-18 in)	>46 cm dbh (>18")		
BRE Mixed-conifer	20	>30	>30	33.3 (145)	37 (15)
CP, UGM, SRM, BRW Mixed-conifer	25	>30	>30	27.5 (120)	30 (12)
CP ⁴ , UGM, BRW Pine-oak ⁵	10	>30	>30	25.3 (110)	30 (12)

¹ % of area pertains to the percent of the planning area, subregion, and/or region in the specified forest type that should be managed for threshold conditions.

²BAs in m²/ha (ft²/acre), and include all trees >1 inch dbh (i.e., any species). We emphasize that values shown are **minimums**, not targets.

³Trees > 46 cm (18 inches) dbh. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets. We encourage retention of large trees.

⁴Pine-oak forest type: ≥10% of the stand BA or 4.6 m²/ha (20 ft²/ac) of BA consist of Gambel oak ≥ 13 cm (5 in) drc.

⁵Pine-oak recommendations apply only to the Mount Taylor and/or Zuni Mountains regions within the CP EMU.

U.S. Fish and Wildlife Service (USFWS). 2012. Final Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico, USA. 413 pp.